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**WE CLAIM:**

- 1           1.     A method for performing photolithography, comprising:  
2                     providing a spatial light modulator with data representing a portion of an  
3 image to be photolithographically transferred onto a substrate, the spatial light modulator  
4 comprising light modulation elements;  
5                     transferring the portion of the image from a first set of the light modulation  
6 elements onto an area of the substrate; and  
7                     transferring the portion of the image from a second set of the light modulation  
8 elements onto the area of the substrate.
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1           2.     The method according to claim 1, further comprising:  
2                     dividing the image into image sections; and  
3                     dividing the image sections into image subsections, the portion of the image  
4 transferred to the substrate corresponding to at least one of the image subsections.
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1           3.     The method according to claim 2, further comprising:  
2                     dividing the light modulation elements into light modulation banks, each light  
3 modulation bank being capable of transferring one of the image subsections.

1           4.       The method according to claim 1, wherein said transferring the portion of the  
2 image from the first set of light modulation elements further comprises:

3                   loading data representing the portion of the image into the first set of light  
4 modulation elements; and

5                   altering the state of ones of the first set of light modulation elements in  
6 response to the data.

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1           5.       The method according to claim 4, wherein the first set of light modulation  
2 elements includes a defective light modulation element, and wherein said transferring the  
3 portion of the image from the second set of light modulation elements further comprises:  
4                   placing one of the light modulation elements in the second set of light  
5 modulation elements corresponding to the defective light modulation element in the first set  
6 of light modulation elements in the correct state as a function of the data loaded into the  
7 second set of light modulation elements.

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1           6.       The method according to claim 1, further comprising:  
2                   transferring the portion of the image from at least a third set of the light  
3 modulation elements onto the area of the substrate.

1           7.     A method for performing photolithography, comprising:  
2                     positioning a substrate having a photosensitive surface in relation to a spatial  
3 light modulator comprising light modulation elements;  
4                     exposing an area of the photosensitive surface with a portion of an image in  
5 response to respective states of a first set of the light modulation elements;  
6                     altering the positional relationship between the substrate and the spatial light  
7 modulator; and  
8                     exposing the area of the photosensitive surface with the portion of the image  
9 in response to respective states of a second set of the light modulation elements.

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1           8.     The method according to claim 7, further comprising:  
2                     achieving grayscale in the image on the area of the photosensitive surface  
3 using both said exposings.

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1           9.     The method according to claim 7, further comprising:  
2                     integrating the total energy from each said exposing on the area of the  
3 photosensitive surface.

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1           10.    The method according to claim 7, further comprising:  
2                     exposing the area of the photosensitive surface with the portion of the image  
3 in response to respective states of a third set of the light modulation elements.

1           11.     A photolithography apparatus, comprising:  
2                     light modulation elements, a first set of said light modulation elements  
3 operable to photolithographically transfer a portion of an image onto an area of a substrate,  
4 and a second set of said light modulation elements operable to photolithographically transfer  
5 the portion of the image onto the area of the substrate; and  
6                     memory elements in communication with respective ones of said light  
7 modulation elements, said memory elements being configured to store data representing the  
8 portion of the image.

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1           12.     The photolithography apparatus according to claim 11, wherein the image is  
2 divided into image sections and the image sections are divided into image subsections, and  
3 the portion of the image corresponds to one of the image subsections.

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1           13.     The photolithography apparatus according to claim 12, wherein said light  
2 modulation elements are divided into sections, each light modulation element section being  
3 capable of transferring one of the image subsections, the first set of light modulation elements  
4 being one of the light modulation element sections and the second set of light modulation  
5 elements being another one of the light modulation element sections.

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1           14.     The photolithography apparatus according to claim 13, wherein said light  
2 modulation elements are arranged in an array having rows and columns.

1           15.     The photolithography apparatus according to claim 14, wherein the first and  
2     second sets of light modulation elements include one or more respective ones of the rows.

1           16.     The photolithography apparatus according to claim 14, wherein the first and  
2     second sets of light modulation elements include one or more respective ones of the columns.

1           17.     The photolithography apparatus according to claim 11, wherein said light  
2     modulation elements comprise liquid crystal material.

1           18.     The photolithography apparatus according to claim 17, wherein said light  
2     modulation elements further comprise:

3                     a common electrode configured to receive a common electrode signal for said  
4     light modulation elements; and

5                     pixel electrodes configured to receive the data stored in said respective  
6     memory elements.

1           19.     The photolithography apparatus according to claim 11, wherein said light  
2     modulation elements comprise micromirrors.

1           20.     The photolithography apparatus according to claim 11, wherein the first set of  
2 light modulation elements includes a defective light modulation element, and wherein one of  
3 the light modulation elements in the second set of light modulation elements corresponding to  
4 the defective light modulation element in the first set of light modulation elements is not  
5 defective.

1           21.     The photolithography apparatus according to claim 11, wherein a third set of  
2 light modulation elements is operable to photolithographically transfer the portion of the  
3 image onto the area of the substrate.

1           22.     A photolithography system for transferring an image to a substrate having a  
2 photosensitive surface, said system comprising:  
3                   a spatial light modulator including light modulation elements, a first set of the  
4 light modulation elements operable to transfer a portion of an image onto an area of said  
5 substrate and a second set of the light modulation elements operable to transfer the portion of  
6 the image onto the area of said substrate; and  
7                   a stage operable to move one of said spatial light modulator and the substrate  
8 relative to the other.

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1           23.     The photolithography system according to claim 22, further comprising:  
2                   a laser optically coupled to said spatial light modulator to illuminate said  
3 spatial light modulator with light.

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1           24.     The photolithography system according to claim 23, wherein the first and  
2 second sets of light modulation elements minimize spatial variations in the intensity of the  
3 light transferred to the substrate.

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1           25.     The photolithography system according to claim 22, wherein the light  
2 modulation elements further include respective memory elements configured to store data  
3 representing the respective portion of the image, the light modulation elements being  
4 alterable in response to the data stored in the respective memory elements.